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Background/Aims: Restricting energy intake for weight management in older people is neither safe nor practical as nutrient depletion may result in impairment of an already compromised immune system. Alternative strategies to combat adiposity without pre-disposing older people to infectious diseases are warranted. *n*-3PUFA may play an important role through their impact on increased fat oxidation and reduced inflammation. This study aimed to examine the relationship between *n*-3PUFA status and anthropometric measures in an older population.
Methods: Older adults ($n = 620$; age 65-95 years; 56.3% females) from the Central Coast region, NSW, Australia were recruited. Anthropometric measurements, including height, weight, BMI, waist (WC) and hip circumference (HC) were taken. The fatty acid composition of erythrocyte membranes was analysed via GC to determine *n*-3PUFA status (%EPA plus %DHA).
Results: A negative association was detected between *n*-3PUFA status and anthropometric measures: BMI ($r = -0.08$, $p < 0.05$), WC ($r = -0.08$, $p < 0.05$) and waist-to-hip ratio (WHR; $r = -0.143$, $p < 0.001$). Stratification of participants based on fish oil supplementation status and gender (supplements: $n = 169$, females 36.7%; no supplements: $n = 451$, females 53.6%) indicated that these associations were gender specific. All female sub-groups displayed a negative association with BMI, WC and WHR that was significant or trending to significance ($r = -0.114$ to -0.211). In contrast, no association between *n*-3PUFA status and anthropometric measures was detected in males.
Conclusions: Weight status was negatively associated with n-3PUFA status in a sex-dependent manner. Therefore, increased intake of *n*-3PUFA via food sources and/or supplementation may assist with weight management in older people, particularly women.
Funding source(s): ARC.

N-3 PUFA STATUS PREDICTS NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD) IN OLDER AUSTRALIANS

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Background/Aims: NAFLD is highly prevalent in older people and currently no specific drugs are available for treatment. *n*-3PUFA, known for their lipid-lowering, anti-inflammatory and anti-hypertensive properties, may have therapeutic potential for the management of NAFLD. The aim of this study was to determine if a relationship exists between *n*-3PUFA status and NAFLD in older Australians.
Methods: Older men and women ($n = 620$; age 65-95 years) living in the Central Coast Region of NSW were recruited. Fatty Liver Index (FLI) scores, used as an indicator of NAFLD, were calculated using a validated algorithm involving BMI, waist circumference, plasma triglycerides and γ-glutamyl transferase. *n*-3PUFA status (%EPA plus %DHA) was determined by analysing fatty acid composition of erythrocyte membranes by GC.
Results: Following application of exclusion criteria, 481 subjects (females 60.7%; mean ± SD age 78 ± 7 years) were included in the analysis. Of those, 218 subjects (females, $n = 107$ or 49.1%) had FLI scores (> 60) suggestive of NAFLD. *n*-3PUFA status was significantly lower in participants with NAFLD compared to those NAFLD ($p < 0.05$). A significant inverse relationship was found between *n*-3PUFA status and FLI ($r = -0.153$; $p < 0.001$). Sex differences were evident, with women but not men showing a significant association between *n*-3PUFA status and FLI ($r = -0.192$; $p < 0.015$).
Conclusions: This study demonstrated a sex-dependent inverse relationship between *n*-3PUFA status and NAFLD in an older population, paving the way for an *n*-3PUFA intervention trial in this high risk age group.
Funding source(s): ARC.

BASELINE OMEGA-3 INDEX CORRELATES WITH AGGRESSIVE AND ATTENTION DEFICIT BEHAVIOURS IN ADULT PRISONERS

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Background/Aims: There is no published data on the omega-3 index in prison populations in relation to mental health. We aim to determine if the variance of the baseline omega-3 index is correlated with aggressive and attention deficit behaviours in a prison population.
Methods: One hundred and thirty six adult male prisoners were recruited from South Coast Correctional Centre (SCCC), NSW Australia. A 7-point categorisation was used to quantify levels of aggressive behaviour (four weeks) from individual SCCC case notes, whereby higher scores correspond to increasingly aggressive behaviour. At baseline, study participants completed an Aggression Questionnaire (AQ) and the Brown's Attention Deficit Disorder Scales (BADDS), provided a blood sample for erythrocyte fatty acid analysis using GC and the omega-3 index was calculated.
Results: The baseline omega-3 index ranged from 2.3% to 10.3% with a median of 4.7%, indicating that some participants already had substantial omega-3 intake. Assessment of aggressive and attention deficit behaviour shows that there were negative correlations between baseline omega-3 index and baseline aggression categorisation scores ($r = -0.21$, $p = 0.016$); total AQ score ($r = -0.234$, $p = 0.011$); Anger ($r = -0.222$, $p = 0.016$); Hostility AQ ($r = -0.239$, $p = 0.009$); indirect aggression ($r = -0.188$ $p = 0.042$); total BADDS ($r = -0.263$, $p = 0.005$); Activation ($r = -0.224$, $p = 0.016$); Attention ($r = -0.192$, $p = 0.043$); Effort ($r = -0.253$, $p = 0.007$); Affect ($r = -0.330$, $p < 0.001$) and Memory ($r = -0.240$, $p = 0.010$).
Conclusions: There is a high variability on baseline omega-3 status of a NSW prison population, and inmates with lower omega-3 index were more aggressive and had higher ADD scores.
Funding source(s): UOW, NSW Department of Corrective Services.

DISTINGUISHING THE NUTRITIONAL REQUIREMENTS AND PHYSIOLOGICAL FATE OF DIETARY EPA AND DHA IN ATLANTIC SALMON

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Background/Aims: Pushed by environmental concerns and economic forces, the aquaculture industry is reducing fish oil utilisation, with positive effects on the sector's sustainability, but negative effects on the *n*-3 long-chain PUFA (*n*-3LCPUFA) content of final products. Aiming at optimising *n*-3LCPUFA utilisation, the different role and fate of EPA and DHA must be clarified.
Methods: Juvenile Atlantic salmon were fed eight experimental diets for 14 weeks, before harvesting and analyses. Positive control (PC; fish oil), and negative control (NC; tallow) reference diets were compared with 6 tallow based diets supplemented with EPA, DHA, or both, at 50% or 100% of the concentration observed in PC. Results were analysed by one-way ANOVA.
Results: Performance results revealed minor, but significant, differences. Fillet fatty acid composition was affected by the dietary treatment, with the highest EPA and DHA concentration (65.4 ± 0.3 and 109.1 ± 2.0 mg/g lipid, respectively) being observed in fish fed EPA+DHA100%, and lowest (8.6 ± 0.4 and 33.8 ± 3.1 mg/g lipid, respectively) in NC. EPA was actively β-oxidised in all treatments (12 ± 7 to 232 ± 59 nmol/g/day), whilst DHA β-oxidation was recorded only in fish fed DHA100%. Independent from DHA availability, in all treatments EPA was readily bioconverted towards DHA, i.e. 39.3 ± 0.4% of dietary EPA was bioconverted in fish fed EPA100%, and 35.8 ± 0.9% in EPA+DHA100%.